



Marine Carbon Monoxide Alarms



Marine Carbon Monoxide Alarms

Marine Technologies, Inc.

- **Founded in 1979**
- **Started manufacturing Marine CO Alarms in 1987**
- **Manufacture CO alarms for the following markets:**
 - **Residential / Industrial**
 - **Recreational Vehicle (RV)**
 - **Marine**
- **Jeff Wisniewski – Operations Manager**
- **David Buddingh – Marketing Manager**



Marine Carbon Monoxide Alarms

History

1989 – UL published UL1524. This is the first marine standard for Carbon Monoxide Detectors. It did not take into account the effect of out-gasses or require “no alarm” limits. This resulted in numerous false positives (nuisance alarms) in the Marine Industry.

1992 – UL published UL 2034. This standard was for residential alarms. Like UL 1524 there was no consideration for low level alarms or alarm delays. This results in numerous false alarms in many cities. Does not address Marine alarms.



Marine Carbon Monoxide Alarms

History

1996 – UL revised the UL 2034 Residential / RV standard. “No alarm” points are required and resistance to nuisance gases and RV requirements are added. This does not address UL 1524 Marine standard for CO alarms.

1996 – Based on Marine market problems and the improvement in the UL 2034 standard, Marine Technologies began building CO alarms that met both standards. False alarm reports drop in residential, RV and Marine markets.



Marine Carbon Monoxide Alarms

History

1998 – UL again revised the UL 2034 Residential / RV standard. “No alarm” points are further tightened. This does not address UL 1524 Marine standard. Manufactures are allowed to still build Marine CO Alarms to 1989 standard.

2001 – UL revised UL 2034 for the 3rd time and finally combines UL 1524 into UL 2034. For the first time in 12 years Marine CO Alarms are held to a higher standard which includes the tight “no alarm” points.



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History

2003 – UL again revised the UL 2034 Residential / RV / Marine standard. It adds five additional nuisance gases commonly found in boat out-gases, which the alarms must now ignore. Effective date is **May 14, 2003**. Marine Technologies is already building CO alarms that meet the new requirements.

2003 – UL revised UL 2034 again to limit alarms that may be caused by 900MHz phones and pagers. Effective date is **Nov. 14, 2003**. Marine Technologies is already manufacturing to this version of the standard.



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Residential vs. Marine Alarms

Can I use a residential alarm on a boat?

Additional Tests required for Marine CO alarms.

- **Salt Water Spray**
- **Cooking Fumes**
- **Vibration**
- **Temperature Extremes**
- **Humidity Extremes**



Sensors

Marine Carbon Monoxide Alarms

Figaro 203 is the only CO sensor to pass UL Marine standards to date.

Japanese made semiconductor sensor – Alarms require minimum 12 Volts DC or AC power to operate within UL requirements with this sensor.

Sensor has remained basically the same since 1985. Microprocessor advancements make better Alarms.

In order to manufacture CO alarms to the every changing UL standard(s) it requires software modifications to interpret the data from the sensor.



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Remote Sensor Issues

Current Alarms use “Time Weighted Average” to determine CO levels. Takes a minimum of 6 – 8 minutes to find CO “average” level. This could be too slow a response time for use under platforms or near the transom.

Current Sensors cannot be exposed directly to water. A gas permeable cover to protect the sensor would be needed – one has not been developed to date.

CO levels are difficult to pin point in open air environment – depends on ‘Which Way the Wind Blows’.

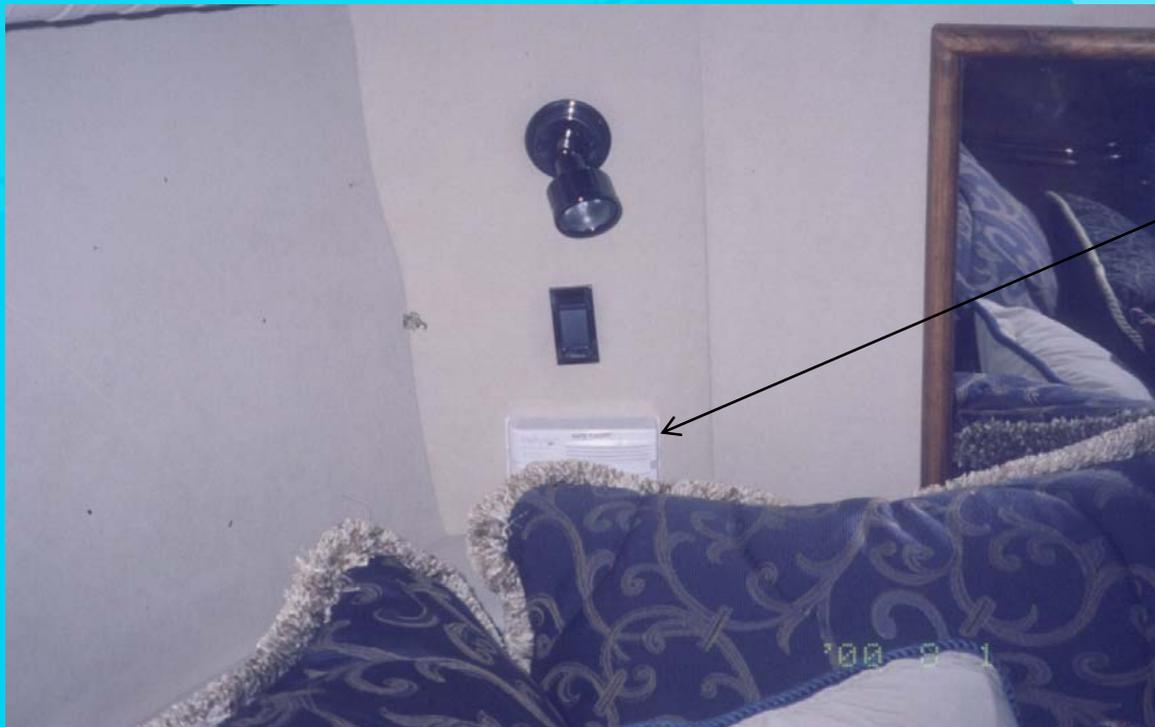
CO Alarm determines CO level at sensor location only.



Marine Carbon Monoxide Alarms

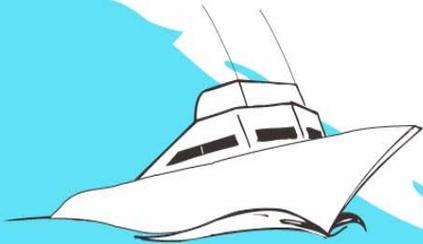
Problems

Where CO alarms are installed.



**Pillow Covers
CO Alarm.**

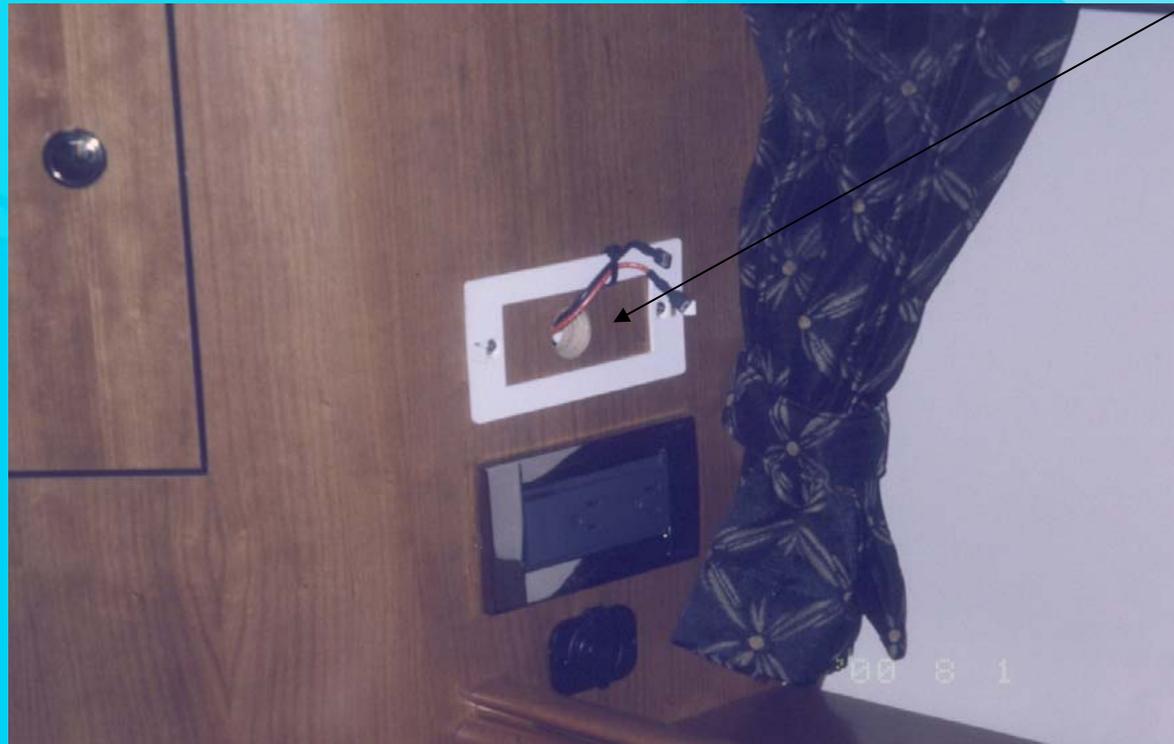
**Alarm must be
Installed to UL /
Manufacturers
Specifications.**



Marine Carbon Monoxide Alarms

Problems

When CO alarms are installed.



This CO Alarm is not installed during transportation.

New UL standard - out gassing tests should stop the need for this practice.

CO Alarms should be connected any time the boat is occupied.



Marine Carbon Monoxide Alarms

Problems

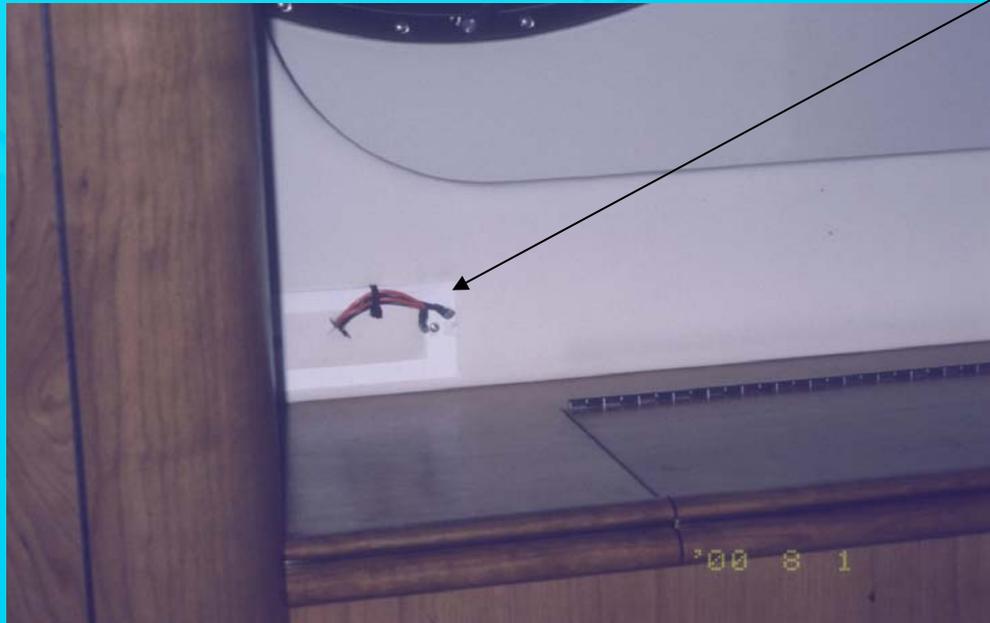
When CO alarms are Disconnected.

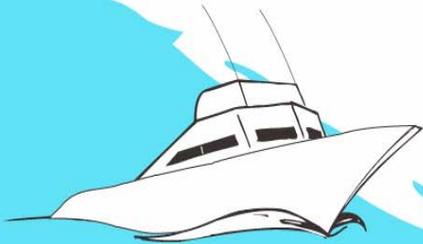
Untrained Marina / Dealer disconnected this CO Alarm after it sounded.

Marine CO Alarms are reliable and should not be disconnected when they alarm.

Action Steps:

- 1. Determine source of CO**
- 2. Fix problem / replace Alarm.**





Marine Carbon Monoxide Alarms

ABYC / NMMA Standard

Beginning Model Year 2003 the National Marine Manufacturers Association (NMMA) has adopted the ABYC standard A-24, “Carbon Monoxide Detectors in Gasoline Powered Boats”.

This action calls for NMMA-certified **manufacturers** to install carbon monoxide (CO) alarms on **gasoline engine** powered boats with closed accommodation compartments. The ABYC standard requires that CO alarms used on boats be listed by Underwriters Laboratories to UL 2034 – Marine Use.



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ABYC A-24 Standard

- **Does Not Address Boats Using Alternate Fuels.**

Some Potential Sources of CO While Boating



- Engine Exhaust
- Portable Space Heaters
- Defective Generator Exhaust System
- Galley Gas Stoves and Ovens
- Defective Engine Exhaust System
- Portable Grills
- Other Docked/Moored/Rafted Boats

- **Does Not Address the Millions of Boats Currently Being Used That Were Build Prior to Standard Adoption.**



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RVIA Standard

Carbon Monoxide alarms are required on specific classes of RVs...

ANSI A119.2 – Fire & Life Safety

3-4.6 Carbon Monoxide (CO) Detectors

“A CO detector is required to be installed in any RV that either contains an internal combustion engine, or is designed to have one installed. This would include all motorized RVs, regardless of whether the fuel source is gasoline, diesel, LP gas or other alternate fuel.”

- RVIA Effective Date 10/93, Revised 9/99.



Marine Carbon Monoxide Alarms

Residential CO Laws

- New York (New Homes & Homes Offered for Sale)
- West Virginia (New Homes)
- New Jersey (All Multi-unit buildings)
- Rhode Island (All Homes transferred by sale)
- Chicago (All Homes with Combustible Fuel Heating)
- St. Louis (All Homes)



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Conclusion

- **Until 2001 Marine Industry was Allowed to Build CO Alarms to Different Standard than Other Markets.**
- **Technology has been improved to Prevent False Alarms. Need to educate Industry that Marine CO Alarms are reliable from factory to final user.**
- **CO Issues can Occur Anywhere on a Boat. Difficult to Detect in Open Air Environment with Current Technology.**
- **Opportunity to Protect Boaters who own Boats built before the 2003 Model Year and that use Alternate Fuels.**